

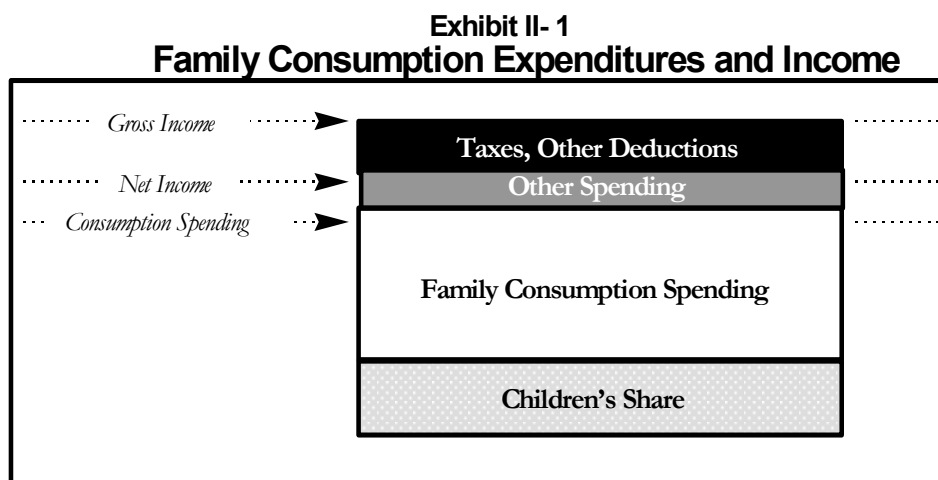
Chapter II

New Economic Data on Child-Rearing Expenditures

Economic estimates of child-rearing expenditures are the foundation of most guidelines schedules. Further, Federal regulation requires that states must consider economic evidence on child-rearing costs as part of their quadrennial review [CFR §302.56]. This chapter discusses the most recent evidence on child-rearing costs and those usually considered by state guidelines review committees. It also compares what guidelines amounts would be using this more recent evidence to those under the existing Michigan Formula, which is based on older evidence of child-rearing costs.

ESTIMATES OF CHILD-REARING EXPENDITURES

Child-rearing expenditures are generally estimated as a proportion of total family spending on consumption. By relating a family's consumption expenditures to total income, we can then derive estimates of spending on children as a proportion of net or gross family income. The relationship between consumption spending on children to total household consumption spending, and thus to net and gross family income, is depicted in Exhibit II-1.



Data Used to Develop Estimates

National estimates of child-rearing expenditures are typically developed using the Federal Bureau of Labor Statistics Consumer Expenditure Survey (CEX). The CEX is the most comprehensive survey of household expenditures conducted. It involves about 37,500 households annually, and comprises two surveys. The first is a monthly diary of household expenditures. The second is a rotating panel survey in which approximately 7,500 households are contacted in each quarter of a calendar year. Most of the economists



combined survey years to get a reasonable sample size for estimating the costs of child rearing. Most sample sizes numbered in the thousands or tens of thousands.

This is the same survey used to develop the market basket of goods for the Consumer Price Index (CPI), the measurement used to track inflation for the nation as a whole, 26 metropolitan areas, and four regions (Northeast, South, Midwest and West).

Overview of the Estimates of Child-Rearing Expenditures

Since statewide child support guidelines have become Federally mandated, states have generally used three different sets of estimates of child-rearing costs to develop, review, and revise child support guidelines schedules.⁷ In addition, a fourth set of estimates has just been released that guidelines review committees are beginning to consider.

- ✓ In 1984, an Urban Institute economist, Dr. Thomas Espenshade developed estimates from 1972-73 CEX data.⁸ These were used by the 1983-87 National Child Support Guidelines project to develop a prototype child support schedule. Subsequently, 26 states (including Michigan) adopted guidelines schedules based on Dr. Espenshade's estimates. Today, eight states (including Michigan) still base their guidelines schedules on Dr. Espenshade's estimates.
- ✓ In 1990, Dr. David Betson, Professor of Economics, University of Notre Dame, was contracted by the US Department of Health and Human Services (DHHS) in response to a congressional mandate to develop new estimates of child-rearing expenditures.⁹ The purpose of this mandate was to provide information to states in order to assist them with updating their child support guidelines. Dr. Betson used 1980-86 CEX data to develop estimates using five different methodologies. Subsequently, 19 states have updated their child support guidelines using Dr. Betson's estimates.

⁷ In addition, there are six states that base their schedules on the Wisconsin Child Support Percentage of Income Standard. They are not included because they are not entirely based on economic estimates of child-rearing costs. The architects of the Wisconsin Standard considered a literature review and critique of the economic estimates of child-rearing costs available in 1981. [Jacques van der Gaag, *On Measuring the Cost of Children*, DP663-81, Institute for Research on Poverty, University of Wisconsin at Madison, Wisconsin (1981)] However, as noted in a recent report for Wisconsin, van der Gaag's numbers were considered but do not form the basis of the Wisconsin Standard. [Ingrid Rothe, Judith Cassetty and Elisabeth Boehnen, *Estimates of Family Expenditures for Children: A Review of the Literature*, Report to the Wisconsin Department of Workforce Development, Institute for Research on Poverty, University of Wisconsin at Madison (April 2001)]. For example, van der Gaag concluded that 25 percent was the best estimate of the proportion of income that parents expend on one child; yet, the Wisconsin Standard applies 17 percent of the noncustodial parent's income to support for one child. Rothe, et al. suggest that the architects of the Wisconsin Standard considered many factors, some which are policy decisions, in arriving at 17 percent for one child and the percentages for other children.

⁸ Thomas J. Espenshade, *Investing in Children: New Estimates of Parental Expenditures* (Washington, D.C.: Urban Institute Press, 1984).

⁹ David M. Betson, *Alternative Estimates of the Cost of Children from the 1980-86 Consumer Expenditure Survey*, Report to U.S. Department of Health and Human Services (Office of the Assistant Secretary for Planning and Evaluation), University of Wisconsin Institute for Research on Poverty (September 1990).

- ✓ In 2000, Dr. Betson received a grant from the University of Wisconsin at Madison Institute for Research on Poverty to update his economic estimates of child-rearing expenditures using more recent data (1996-98). The State of California Judicial Council published preliminary results of those estimates in a 2001 report as part of its quadrennial review of its child support guideline.¹⁰ Because the estimates are so new, they have not been adopted by any state, but several states are currently examining them as part of their quadrennial guidelines review.
- ✓ The US Department of Agricultural (USDA) develops annual estimates of child-rearing expenditures using 1990-92 CEX data.¹¹ The USDA estimates break child-rearing expenditures down by several different consumption goods (e.g., housing, food, and transportation). We know of no state that uses the USDA estimates as the basis of its schedule. Nonetheless, most state guidelines review committees examine them as part of their quadrennial guidelines review.

The estimates generally rely on two different types of methodologies.

- ✓ One methodology is “per capita.” Per capita simply divides the total family expenditures by the number of family members to get at each family member’s share. As a consequence, the child’s share is the same as a parent’s share.
- ✓ The other methodology is called “marginal cost.” The marginal cost assumes the parents are already making household expenditures and asks, “How much more does it cost for the child?”

An economic methodology is required to disentangle the children’s share from the adults’ share of all household expenditures. This is necessary because the children’s share and the adults’ share are not readily observable for most household expenditures categories (e.g., housing, transportation and food). In contrast, some categories of expenditures are obviously made on behalf of the children (e.g., child care expenses and infant clothing). In a similar vein, some expenditures are obviously made on behalf of adults.

Espenshade used a marginal cost methodology. Dr. Betson used several methodologies: most rely on different approaches toward measuring marginal cost but he also uses some per capita methodologies. The USDA estimates are partially based on a per capita methodology.

Estimates Based on Marginal Costs

Most household spending on children cannot be directly observed. Parents can separately track, and account for, spending on such categories as children’s clothing, educational expenses, and child care. However, for those expenditure categories accounting for the bulk

¹⁰ David M. Betson, “Parental Expenditures on Children,” in *A Review of California’s Statewide Uniform Child Support Guideline*, Judicial Council of California, San Francisco, California, (2001).

¹¹ Mark Lino, *Expenditures on Children by Families: 2000 Annual Report* U.S. Department of Agriculture, Center for Nutrition Policy and Promotion. Miscellaneous Publication No. 1528-2000 (2001).

of child-related expenditures, spending on children is inextricably intertwined with spending on adults. These categories of pooled family expenditures include food, housing, utilities, home furnishings, transportation, most recreation, and most health insurance. To determine how much of the household budget is spent on children, it is necessary to devise and apply an estimation methodology that indirectly calculates the children's share.

Several economic methodologies have been developed to produce such estimates. Most attempt to estimate the marginal, or extra, expenditures made on behalf of the children relative to expenditures in the absence of any children. They do so by comparing expenditures between two households that are equally well off economically, one with children and one without. The additional expenditures by the household with children are deemed to be the costs of child rearing.

An example, shown below, illustrates this method. In this example, the households are both assumed to have two adults and are considered to be equally well off. The family without children (Family A) has expenditures of \$18,000 per year and the family with children (Family B) has expenditures of \$30,000 per year. Yet, in this example, Family B must spend \$12,000 more to be as well off as Family A. That \$12,000 can be considered as the marginal cost of the children. Since \$12,000 is 40 percent of \$30,000, we would estimate the total cost of the two children to be 40 percent of total household expenditures. The methodology can also be applied to compare expenditures by equally well off households with varying numbers of children. This yields estimates of additional costs of a second and third child, for example.

	Family A	Family B	
Number of Children	0	2	
Total Household Expenditures	\$18,000	\$30,000	
Children's Additional Cost		\$12,000	
Children's Share of Total		\$12,000 / \$30,000 = 40%	

In order to estimate the children's share of expenditures in this manner, it is necessary to construct a standard of well-being that is independent of income. Only with such a standard can we consider two families to be equally well off, one with children and one without, even though they have different incomes. Several such standards of well-being have emerged from the economic literature on child-rearing expenditures. The two main ones are the Rothbarth and Engel estimators.

Engel Estimator

The Engel estimator was used by Dr. Espenshade. As mentioned earlier, his estimates form the basis of the existing Michigan Formula, as well as that of seven other states. Over a century ago, economist, Ernst Engel, found that as a family's income increases (holding family size constant), the percentage of the family's expenditures on food decrease, even though total spending increases. This means that a family's spending on food increases more slowly than income. Under this standard, total expenditures devoted to food are deemed to be a valid indicator of economic well-being. Thus, if two families of different size spend the same proportions of their incomes on food, they are deemed to be equally well off.

The Engel estimator was used by Dr. Espenshade in 1984 to develop estimates of child-rearing expenditures from 1972-73 Consumer Expenditure Survey (CEX) data. Since Dr. Espenshade's estimates were the best available estimates on child-rearing expenditures at the time, Dr. Espenshade's estimates were used by the National Child Support Guidelines Project to develop prototype child support schedules for the Income Shares model. Most states, including Michigan, that adopted the Income Shares approach developed their Schedule from Dr. Espenshade's estimates. In addition, the Engel methodology was used in the development of the U.S. poverty standard, the Bureau of Labor Statistics equivalency scale.

Dr. Betson also developed estimates from the Engel methodology in both his 1990 and 2001 study. He used the same data set as Dr. Espenshade; that is, the CEX, but Dr. Betson used 1980-86 data for his 1990 study, and 1996-98 data for his 2001 study.

As discussed in the 1990 Lewin/ICF evaluation of child-rearing cost estimates, the 1990 Betson-Engel estimates are greater than the Espenshade-Engel estimates.¹² Specifically, the 1990 Betson-Engel estimates, which are based on 1980-86 data, found that families allocate 33 percent of their consumption to one child, 49 percent to two children and 59 percent to three children. The Espenshade-Engel estimates, which are based on 1972-73 data, found that families allocate 24 percent of their consumption to one child, 41 percent to two children and 51 percent to three children. Lewin/ICF could not discern whether the difference results from changes in child-rearing expenditures over time or differences in the procedures used by Drs. Betson and Espenshade.

Dr. Betson's estimates based on the Engel methodology applied to the 1996-98 data were somewhat less than his estimates based on the 1980-86 data but still more than the Espenshade-Engel estimates. The Betson-Engel estimates that are based on 1996-98 data found that families allocate 30 percent of their consumption to one child, 44 percent to two

¹² Lewin/ICF, *Estimates of Expenditures on Children and Child Support Guidelines*, Report to U.S. Department of Health and Human Services (Office of the Assistant Secretary for Planning and Evaluation), Lewin/ICF (October 1990).



children and 52 percent to three children. Dr. Betson found no significant statistical difference in his Engel estimates from the 1980-86 to 1996-98 data for one and two children, but did find a statistical difference for three children. The statistical insignificance suggests that the differences may result from differences in the sample and not differences in parental spending patterns over time.

Exhibit II-2 summarizes the results of estimates of child-rearing costs developed using the Engel estimator from the three different studies.

Exhibit II-2 Summary of Estimates of Child-Rearing Expenditures Using Engel Estimator					
Economist and Year of Study	Data Years ^a	Use in State Child Support Schedules	Average child-rearing expenditures as a percent of total family expenditures		
			One Child	Two Children	Three Children
Espenshade (1984)	1972-73	Used by Michigan and 7 other states. Also used in the Prototype Income Shares Schedule	24%	41%	51%
Betson (1990)	1980-86	Rejected because they near per capita amounts, it is generally accepted that the true costs of child rearing are less than per capita amounts ^b	33%	49%	59%
Betson (2001)	1996-98	Just released last year, no state has yet considered them	30%	44%	52%

^aAll of the estimates were developed using data from the Federal Bureau of Labor Statistics Consumer Expenditures Survey.

^bPer capita amounts (which can also be called average costs) will be more than marginal costs amounts due to economies of scale. An analogy would be the costs of a home-cooked meal. The costs for a one-person meal can be substantial, so the marginal cost of adding one dinner guest is small. Yet, if the costs of the dinner were averaged across the two persons it would be more than the marginal cost of that second person. The same could be said about the marginal cost and average cost of a third person and so forth.

Rothbarth Estimator

The Rothbarth estimator uses the proportion of family expenditures on luxury goods as a standard of well-being. As stated by Lewin/ICF, economist Erwin Rothbarth “... argued that the best way to measure expenditures on children is to assess children’s impact on their parents’ consumption.”¹³ Rothbarth assumed that well-being should be determined by comparing the levels of “excess income” available once necessary expenditures on all family members have been made, with excess income defined to include luxuries (alcohol, tobacco, entertainment, and sweets) and savings.

Studies which have used the Rothbarth methodology to estimate child-rearing expenditures — including Dr. Betson’s — have limited the definition of excess income to those goods which are assumed to be used only by adults, usually adult clothing, alcohol, and tobacco. In fact, Dr. Betson tested the sensitivity of his estimates to several alternative definitions of

¹³ *Estimates of Expenditures on Children*. p. 2-16.

“adult goods:” adult clothing alone, and adult clothing plus tobacco and alcohol. He found there was little variation in results with these changes in definition. This finding suggests that his estimates have not been significantly compromised by any data inadequacies in the measurement of spending for tobacco and alcohol.

Dr. Betson used this standard of well-being (i.e., household expenditures on adult clothing, tobacco, and alcohol) as well as others to compare spending by families with and without children, who were equally well off. He then derived estimates of spending for two children compared with one, and three children compared with two. His 1990 estimates of the average proportion of consumption expenditures allocated to children based on 1980-86 data are 25 percent for one child, 37 percent for two, and 44 percent for three.¹⁴ Dr. Betson’s comparable 2001 Rothbarth estimates based on 1996-98 data are 25 percent for one child, 35 percent for two, and 41 percent for three.¹⁵ There are no significant differences in the average Betson-Rothbarth estimates of child-rearing expenditures from 1980-86 to 1996-98.

Since Dr. Betson’s 2001 updated estimates are new, it is not surprising that they are not used in any State’s guidelines at this time. However, there are 19 states that base their child support schedules on the original Betson-Rothbarth estimates.

Exhibit II-3 summarizes the results of the estimates of child-rearing costs developed using the Rothbarth estimator from the two studies.

Exhibit II-3					
Summary of Estimates of Child-Rearing Expenditures Using Rothbarth Estimator					
Economist and Year of Study	Data Years ^a	Use in State Child Support Schedules	Average child-rearing expenditures as a percent of total family expenditures		
			One Child	Two Children	Three Children
Betson (1990)	1980-86	Used by 19 states	25%	37%	44%
Betson (2001)	1996-98	Just released last year, states are just beginning to consider them	25%	35%	41%

^aAll of the estimates were developed using data from the Federal Bureau of Labor Statistics Consumer Expenditures Survey.

¹⁴The Lewin Report which is also quoted in the USDA study lists the Betson-Rothbarth estimates as 25, 35 and 39 percent for one, two and three children (See Table 4.5 of the Lewin Report). Yet, Betson actually estimated child-rearing expenditures based on the Rothbarth methodology through numerous specifications that varied by the ages of the children, total household expenditures, and how adult goods are defined. Lewin selected the Betson-Rothbarth estimates with specifications most similar to that of a much earlier study estimating child-rearing expenditures using the Rothbarth methodology. The estimates reported above are more in align with those in Table F11 of Betson (1990). They are statistically the most valid of the Betson-Rothbarth 1980-86 estimates.

¹⁵ The estimates based by 1996-98 data are currently unpublished. In fact, Betson plans to include 1997-99 data in his final report. At the time of the California report, which is the only published result of Betson’s new study, Betson only had data available from 1996-97. Those estimates were negligibly different but statistically insignificant than the estimates based on 1996-98 data. They are 26 percent for one child, 35 percent for two, and 42 percent for three.



Other Marginal Cost Estimators

In addition to the Rothbarth and Engel estimators, Dr. Betson considered two other marginal cost estimators in his 1990 study (i.e., ISO-PROP and Barten-Gorman). Neither of those estimators yielded valid results.

Per Capita Measurements

Child-rearing costs are estimated using two other non-marginal cost methodologies in the Dr. Betson studies. In Dr. Betson's 1990 study, he also applies a per capita method; that is, the total household costs are divided by the number of household members to determine each householder's share. For example, if there are two parents and one child, the child's share is 33 percent.

In Dr. Betson's 2001 study, he also applied the methodology used by the United States Agriculture Department (USDA), which is discussed in greater detail below.

U.S. Department of Agriculture Estimates

The U.S. Department of Agriculture's (USDA) Center for Nutrition Policy and Promotion develops economic estimates for the major categories of child-rearing expenditures (i.e., housing, food, transportation, clothing, health care, child care and education and miscellaneous child-rearing expenditures). Each category is measured separately, then added together to arrive at a total estimate of child-rearing costs. Most of the major categories are measured using a per capita approach (i.e., housing and transportation and miscellaneous goods).

Although many states examine the USDA estimates as part of their quadrennial guidelines review, we know of no state that uses the USDA estimates as the basis of its child support schedule. In part, this is because the estimates are generally much higher than the amounts of most states guidelines schedules. Further, since the USDA only considers three income ranges (i.e., low-income, middle-income, and high-income), it is difficult to extrapolate between income ranges, particularly from zero dollars in income to the highest amount considered in the low-income range. Some extrapolation is necessary at low incomes so guidelines-determined amounts do not exceed income. Further, extrapolation is needed so obligation amounts are below permissible income withholding limits under Federal law. The premise in this case is that it makes no sense to set an order amount above what can be withheld from the noncustodial parent's paycheck.

USDA's most recently published figures are based on data from the 1990-92 CEX, updated to 2000 dollar levels using the Consumer Price Index (CPI). The USDA publication is easy to read and provides useful information that is not available from the Rothbarth and Engel

estimates. Specifically, the USDA provides estimates of child-rearing expenditures by expenditure category (e.g., housing, food), region, and age of the child. Yet, unlike the Rothbarth and Engel estimators, USDA does not measure the marginal cost of children to a household; that is, how much more a childless family would have to spend to maintain their current well-being if they did have children. Many of the largest expenditure categories considered by USDA are estimated using an average cost approach.

In general, USDA's methodology differs considerably from the Rothbarth and Engel methodologies, although it uses the same data set that Drs. Betson and Espenshade used to estimate child-rearing expenditures. The USDA estimates child-rearing expenditures for each category separately, then adds them together to arrive at a total amount of child-rearing expenditures. How expenditures are measured for each category varies. The USDA first apportions housing, transportation, clothing services (e.g., dry cleaning) and miscellaneous other expenses among all members of the household on a simple per capita basis. Assuming the baseline family consists of a husband and wife and two children, USDA then uses multivariate analysis to adjust these estimates for one-child and three or more children families.

Food and health care expenditures are allocated among each family member using proportions derived from the National Food Consumption Survey conducted by the U.S. Department of Agriculture and the National Medical Care Utilization and Expenditure Survey conducted by the U.S. Department of Health and Human Services.

Expenditures on children's clothing, education, and child care, which are directly reported in the CEX, are divided equally among each child in USDA's baseline family (i.e., the two children). Multivariate analysis is then used to adjust these estimates for one child and three or more children.

Based on this approach, USDA estimates child-rearing expenditures for a range of gross incomes. The USDA estimates are also presented as a proportion of total household expenditures; they average: 26 percent of household expenditures for one child; 42 percent of household expenditures for two children; and 48 percent of household expenditures for three children. Dr. Betson also developed estimates using a modified version of the USDA methodology from the 1996-98 data. He estimated that the proportion of total household expenditures devoted to children are: 32 percent for one child, 46 percent for two children and 58 percent for three children.

Exhibit II-4 summarizes the estimates based on the USDA methodology, which is partially a per capita approach.

Exhibit II-4 Summary of Estimates of Child-Rearing Expenditures Using USDA Method					
Economist and Year of Study	Data Years ^a	Use in State Child Support Schedules	Average child-rearing expenditures as a percent of total family expenditures		
			One Child	Two Children	Three Children
Lino (2000)	1990-92	Used by 0 states, but examined by most states ^b	26%	42%	48%
Betson (2001)	1996-98	Just released last year, we know of no state that has seriously considered them	32%	46%	58%

^aAll of the estimates were developed using data from the Federal Bureau of Labor Statistics Consumer Expenditures Survey.

^bAt one time, a Wyoming child support administrator claimed that its schedule was based on the USDA, but we were not able to confirm it. In fact, the Wyoming Schedule is more similar to the Michigan Schedule than the USDA estimates.

Summary of Estimates

Exhibit II-5 provides a summary of the estimates of child-rearing expenditures currently used or considered by states and new estimates.¹⁶ Specifically, it displays the average percent of family expenditures devoted to child-rearing costs for one, two and three children for the:

- ✓ Espenshade-Engel estimates based on 1972-73 CEX data;
- ✓ Betson-Engel estimates based on 1996-98 CEX data;
- ✓ Betson-Rothbarth estimates based on 1980-86 CEX data;
- ✓ Betson-Rothbath estimates based on 1996-98 CEX data;
- ✓ Lino-USDA estimates based on 1990-92 CEX data; and,
- ✓ Per capita amounts.

The estimates do not consider changes in savings or the amount of consumption or personal income tax rates over time because they are expressed as a percent of total family expenditures.

As displayed in Exhibit II-5, there is considerable range in the estimates. For example, the proportion of family expenditures devoted to child-rearing costs for one child ranges from a low of 24 percent to a high of 30 percent. For two children, the range is 35 to 44 percent and for three children the range is 41 to 52 percent.

¹⁶ The Betson-USDA estimates are excluded because the intent of the Betson estimates was to test the impact of a slight modification to the USDA methodology not to update the estimates.

Exhibit II-5 Summary of Estimates of Child-Rearing Expenditures						
Economist and Year of Study	Method- ology	Data Years ^a	Use in State Child Support Schedules	Average child-rearing expenditures as a percent of total family expenditures		
				One Child	Two Children	Three Children
Espenshade (1984)	Engel ^b	1972-73	Used by Michigan and 7 other states. Also used in the Prototype Income Shares Schedule	24%	41%	51%
Betson (2001)	Engel ^b	1996-98	Just released last year, no state has yet seriously considered them	30%	44%	52%
Betson (1990)	Roth- barth ^c	1980-86	Used by 19 states	25%	37%	44%
Betson (2001)	Roth- barth ^c	1996-98	Just released last year, states are just beginning to seriously consider them	25%	35%	41%
Lino (2000)	USDA	1990-92	Used by 0 states, but examined by most states	26%	42%	48%

^aAll of the estimates were developed using data from the Federal Bureau of Labor Statistics Consumer Expenditures Survey.

^bMarginal cost approach that uses food shares as equivalency scale between equally well off households with and without children.

^cMarginal cost approach that uses expenditures on adult goods as equivalency scale between equally well off households with and without children.

Range of Estimates

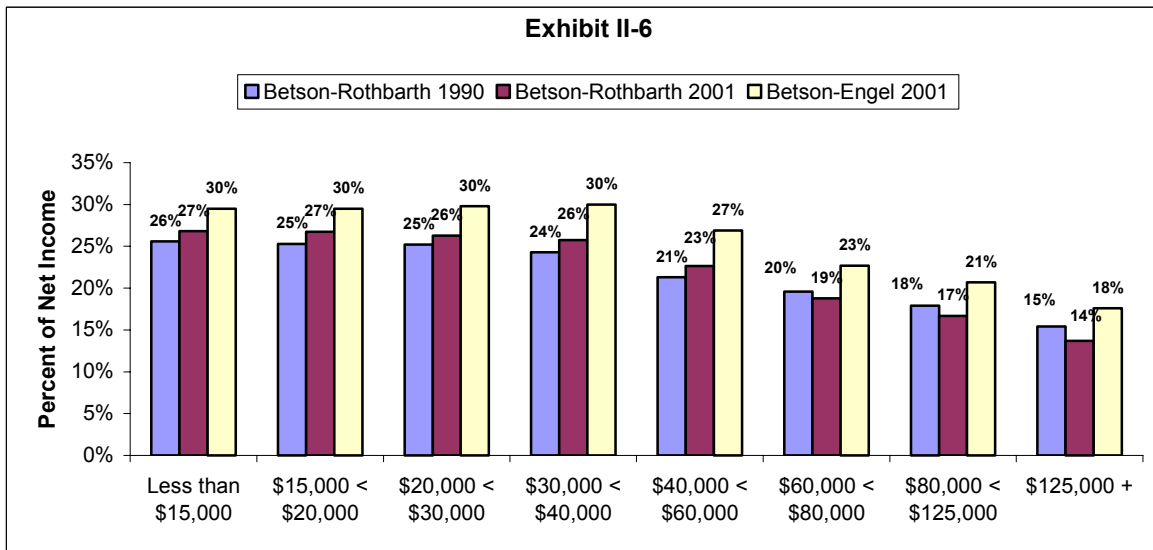
The average estimates of child-rearing expenditures do not tell the complete story of how they vary. As evident in Exhibit II-5, they also vary significantly when a range of incomes is considered. Exhibit II-5 displays the average percent of net income devoted to one child for a range of net incomes for the 1990 Betson-Rothbarth estimates, the 2001 Betson-Rothbarth estimates, and the 2001 Betson-Engl estimates.

All estimates indicate that the percentage of net income devoted to child-rearing expenditures decreases as income increases. The total dollar amount spent on the children still increases with net income, but when expressed as a percentage of net income, percentages decrease as income increases.

Exhibit II-6 shows the percentage of net income devoted to one child at the lowest to highest incomes.

- ✓ The 1990 Betson-Rothbarth estimates range from 26% for the lowest income to 15% for the highest income considered.
- ✓ The 2001 Betson-Rothbarth estimates range from 27% for the lowest income to 14% for the highest income considered.
- ✓ The 2001 Betson-Engl estimates range from 30% for the lowest income to 18% for the highest income considered.

Similar patterns exist for two and more children.



*The 1990 Betson-Rothbarth estimates are approximations for these income ranges.

CHOICE OF ESTIMATORS

Among economists, no consensus has emerged that any single estimator is better than another. All have their limitations and biases. As a result, the 1990 Lewin/ICF report issued by the U.S. Department of Health and Human Services does not express any opinion concerning the single best estimator of child-rearing expenditures. Rather, it states that the various estimates should be considered as expressing a range of results. Of the estimates derived, however, which include several other formulations, only the Rothbarth and Engel methodologies are without serious problems of empirical specification. The primary bias of the Engel methodology, according to the Lewin/ICF Report, is that it is theoretically most likely to overstate child-rearing expenditures. In contrast, the primary bias of the Rothbarth methodology is that it is likely to understate child-rearing expenditures.

1990 Report to DHHS suggests that the Engel and Rothbarth estimators form the upper and lower bound of estimates and the true cost of child-rearing is somewhere between the two estimates.

The Espenshade-Engel and the 1990 Betson-Rothbarth estimators have withstood the test of time. The Espenshade-Engel estimator has been used for over 20 years in child support schedules. The Betson-Rothbarth estimator has been used for about eight years in child support schedules. As mentioned earlier, 19 states base their schedules on the Betson-Rothbarth estimates. This makes the Betson-Rothbarth estimate the most commonly used among states. The second most used estimator is the Espenshade-Engel estimate, used by eight states. None of the rest of the economic estimates are used by states.

Dr. Betson favors the Rothbarth estimator over the Engel estimator for empirical and theoretical reasons. Because the 1990 Betson-Engel estimates approach per capita (i.e.,

average cost) estimates of child-rearing expenditures they appear unreasonable.¹⁷ The economic concept of “marginal cost” is that the second is cheaper than the first, and the third is cheaper than the second, and so forth. In contrast, average costs assume that the first, second and third of cost exactly the same. Further, in the California report, Dr. Betson raises concerns with the theory behind the Engel estimator.¹⁸ He suggests that the results of the difference between one- and two-child expenditures and two- and three-child expenditures are theoretically biased in the Engel estimator. He further suggests that the Rothbarth estimator does not contain a similar bias.

The USDA estimates are not deemed suitable because they rely on a per capita cost approach. The Lewin Report concludes that a per capita approach has limit merit.¹⁹ The division of some expenditures between parents and children assumes a conclusion about the real allocation of those expenditures, which is particularly bothersome for setting child support awards. Child support is commonly understood to provide for the additional costs of children. It seems very unlikely that the costs of children would proportionately equal the adult’s initial costs in those categories of expenditures. For purposes of child support, a marginal cost approach to estimating costs of child rearing is a more appropriate method.

OTHER ISSUES PERTAINING TO ESTIMATES OF CHILD-REARING EXPENDITURES

(1) Use of national data for state guidelines

As discussed earlier, most state child support schedules using economic studies on child-rearing expenditures rely on estimates developed from the Consumer Expenditure Surveys conducted by the Bureau of Labor Statistics. These surveys are used because they are the most detailed available source of data on household expenditures. Data of this depth and quality are simply not available at the state level. Moreover, replication of the Consumer Expenditure Survey at the state level would be extremely costly. Because of the methods that must be used to estimate child-rearing expenditures, the absence of such data precludes the development of accurate estimates specific to a given state. This is why no state has attempted to develop such a data source and conduct its own research on child-rearing expenditures.

(2) Use of data from intact families to determine child support levels

The Michigan Formula is based on the Income Shares Model, which seeks to apportion the child-rearing expenditures between the parents based on what the parents would have spent if the household was intact. Hence, the child-rearing expenditures discussed in this report are

¹⁷ Betson (1990), page 56.

¹⁸ Betson (2001).

¹⁹ Lewin (1990, page 2-6.

estimates from samples of intact, two-parent households. Since child support is required only when the household is not intact, some have argued that child-rearing expenditure data from single-parent families should be used as the basis for child support levels. For example, as discussed later in this report, the Cost Shares Guidelines Model is based on child-rearing expenditures in single-parent families.

Although such data have generally not been available in the past, Dr. Betson did formulate such estimates in his research. However, those estimates are based on much smaller sample sizes than the estimates for two-parent households, hence affect reliability of the estimates.²⁰ Unfortunately, even if valid data exist on expenditure patterns in one-parent households, such data do not provide meaningful guidance for setting child support awards. In economic terms, the “costs” of child rearing are defined by what parents actually spend on their children, at least above a minimum (i.e., poverty) level. However, since about a quarter of single-parent families live in poverty, there are not always expenditures above a poverty level. All economic studies on child-rearing costs have found that parents spend more on children as they have more income available. The relevant question is, how much of that additional income do they spend on the children?

It is well known that single-parent households with children have lower incomes, hence less money to spend than intact families. If they are not receiving child support, they even have lower income. Due to these low-income issues, any study of single-parent households will observe a lower level of spending on children overall than would be observed in two-parent households because less income is available in the single-parent household. The fact that single-parent households actually do spend less income on children than two-parent households does not mean that they should spend less if the other parent has the means to provide more child support.

A simple example will help to illustrate this point. Assume that two different single-parent households exist, each with two children, and each with income before child support of \$1,000 per month. Assume also, that in the absence of child support each of these households would spend \$600 per month on the two children. Finally, assume that the noncustodial parent in the first case had monthly income of \$5,000, while the noncustodial parent in the second case had monthly income of \$1,000. Clearly, the noncustodial parent in the first case should pay substantially more child support than the noncustodial parent in the second case. This reflects the greater ability to pay, and the fact that the children’s standard of living would have been much higher if the first household were intact than if the second household were intact.

That spending on the children in the two single-parent households in this example was the same level (and much lower than it should be given the incomes of the noncustodial parents)

²⁰One particular limitation of the data is that since single-parent families have lower incomes on average, there are generally too few single-parent families with higher incomes in the data to develop reliable estimates of child-rearing expenditures for this group.

has no relevance to the child support determination except as it reflects the custodial parent's ability to contribute. It does not reflect the noncustodial parent's ability to pay, the standard of living the children would have had the parents lived together, or indicates how the children could share in the noncustodial parent's standard of living. In contrast, child-rearing data in two-parent households provides more information about what the children's standard of living could be if two parents supported them. This demonstrates why it is appropriate to rely on child-rearing data from two-parent households rather than one-parent households for determination of child support obligations. Other issues with using estimates of child-rearing expenditures in single-parent families are discussed in more detail in Chapter III, which analyzes the Cost Shares Model, that incorporates estimates of child-rearing expenditures in single-parent families.

(3) Schedule amounts for four or more children

The studies estimating child-rearing expenditures apply to three or fewer children. Amounts for four and more children are not estimated because of data limitations. There are not enough four or more children households in the CEX to provide an adequate sample size. As a consequence, most States use equivalency scales to extend the amounts for three children to four and more children. For example, the amounts for four and more children in the existing Michigan Formula are developed from information from Dr. Espenshade and the Bureau of Labor Statistics on equivalent consumption levels for different family sizes to project consumption levels with more children. This information was used to develop ratios to extend the proportion of net income spent on three-child households to households with larger numbers of children. The ratios were assumed to be constant across income ranges and were used as multipliers to extend the three-child estimates to four, five and six children.

New equivalency scales have been developed by the Panel on Poverty and Family Assistance, a panel assembled by the National Research Council to review how poverty is measured and make recommendations for improving those measurements.²¹ As part of this investigation, the Panel extensively reviewed equivalency scales; that is, formulas that adjust the costs of living relative to family size. In turn, the Panel recommended a formula for extending estimates to larger family sizes.²²

$$\text{equivalency scale value} = (\text{Number of adults} + 0.7 \times \text{number of children})^{0.7}$$

Using this formula, we arrive at the following equivalency scales: 2.69 for three children; 3.00 for four children; 3.30 for five children; and, 3.59 for six children. In turn, these are converted to multipliers. For example, the multiplier for four children is 1.115 (3.00 divided by 2.69). Based on this method, we also develop multipliers for five and six children. They

²¹ Constance F. Citro and Robert T. Michael, Editors. *Measuring Poverty: A New Approach*, National Academy Press, Washington, D.C. (1995).

²² Ibid.



are displayed in Exhibit II-7 along with the multipliers used in the existing Michigan Formula.

Exhibit II-7 Comparisons of Multipliers Used to Extend Estimates of Child-Rearing Expenditures for Four or More Children		
Number of Children	Multipliers Used in Michigan's Existing Schedule	Multipliers Based on National Research Council's Recommendations
4	1.1274 x 3 child proportion	1.115 x 3 child proportion
5	1.0904 x 4 child proportion (for 5 or more children)	1.100 x 4 child proportion

COMPARISONS TO MICHIGAN FORMULA

This section provides graphical and tabular comparisons of the Michigan Formula to obligation amounts calculated using the various estimators (updated Betson-Engel, Betson-Rothbarth, updated Betson-Rothbarth and Lino-USDA). In order to make the Betson estimates from Exhibits II-5 and II-6 comparable to the Michigan Formula, they are adjusted to exclude child care expenses and the child's extraordinary medical expenses and the child's health care expenses. A small amount for ordinary medical expenses, which is similar in purpose to the medical supplement under the Michigan Formula is retained in the Betson estimates.²³

The comparisons are for 1, 2 and 3-child households, respectively. The first three graphs (Exhibits II-8 through II-10) depict order levels under the assumption that the obligee has no income. In Michigan, this would also be the assumption made about the obligee whose net income is below the poverty level for one person.

Exhibits II-11 and II-12 depict the situations where the obligee has half as much income as the obligor, and income equal to that of the obligor, respectively, for two-child households. Situations where the obligee income is half the amount of obligor income approximate the relationship between male and female earnings, so may be more typical than other obligee income situations depicted.²⁴ Comparable exhibits for one and three children are provided in Appendix I. Comparisons for four and more children are not provided because they would track identically to three-child obligations because of the multiplier used to convert

²³ All medical expenses were excluded from the USDA estimates. The USDA does not make the distinction between the child's medical expenditures for out-of-pocket health insurance premiums; extraordinary medical expenses, and ordinary medical expenses.

²⁴ The actual ratio of female to male earnings is 68 percent, but this considers all females and males, not those with children. The ratio is likely to be lower when only females with children are considered because females with younger children are less likely to work outside the home and the average hours worked vary with the age of the child. [U.S. Department of Labor Bureau of Labor Statistics, *Highlights of Women's Earnings in 2000*. Report 952 (August 2001) and *Employment Characteristics of Families*, USDL-02-175 March 2002].

three-child amounts to four-child amounts. (As discussed earlier, multipliers are necessary to convert three-child amounts to four or more child amounts because of insufficient data on four or more child households).

The figures display levels of support obligations as percentages of obligor net income across a range of incomes from \$150 to \$1,500 per week. An important consideration is that in reading the figures the x-axis is not an interval level scale. That is, although support is shown as a proportion of net income for each \$50 increase in income through \$500 per week, the scale changes to \$100 income increases through the remainder of the income range. As a result, the fairly rapid descent of the curves above \$500 per week is an artifact of the income scale used in the figures. The actual curves would decline much more slowly if \$50 income increments had been used throughout the income range. The shaded areas of the tables in the following exhibits represent application of a low-income adjustment.

It is useful to note that these comparisons assume there are no additional expenses, such as child care costs or children's extraordinary medical expenses. In most Income Shares states, a formulaic adjustment is made for these factors.

Exhibit II-8: One Child, Obligee Income = \$0

Exhibit II-8 displays support obligations for a range of obligor net incomes from \$150 to \$1,500 per week. In this scenario involving one child, the obligee has no income.

As can be seen in this scenario, the Michigan Formula tracks very closely to both the new and old Betson-Rothbarth obligations. As is to be expected based on the discussion above, the USDA and Engel obligations are the highest. The USDA estimates are near per capita amounts (33%) at many incomes. Order amounts based on the Engel estimates, which are generally recognized as the upper bound of child-rearing estimates, also track high.

Exhibit II-9: Two Children, Obligee Income = \$0

Exhibit II-9 displays support obligations for two children when the obligee has no income.

The trends found in Exhibit II-8 are also evident here. That is, the Michigan Formula tracks closely to both the new and old Betson-Rothbarth obligations, the Engel obligations are slightly higher, and the USDA obligations are significantly higher, especially at lower incomes. A gap between the old and new Dr. Betson estimates becomes more apparent at higher incomes. The new Dr. Betson estimates indicate a smaller amount spent on the children when there is more income. This is reflected in Exhibit II-9.

Exhibit II-10: Three Children, Obligee Income = \$0



Exhibit II-10 displays support obligations for three children when the obligee has no income.

In this scenario, the Michigan Formula tracks closely with the Betson-Engel obligations and are slightly higher than the Betson-Rothbarth obligations across all income levels. This occurs because the Rothbarth estimates indicate a smaller amount spent on three children than the Engel estimates. As for one and two children, the USDA obligations are the highest for all income levels.

Exhibit II-11: Two Children, Oblige Income = 50% of Obligor Income

Exhibit II-11 considers the scenario where there are two children and the obligee has half as much income as the obligor. That is, if the obligor has a net income of \$1,000 per week, the obligee is assumed to have a net income of \$500; if the obligor earns \$1,200, the obligee earns \$600.

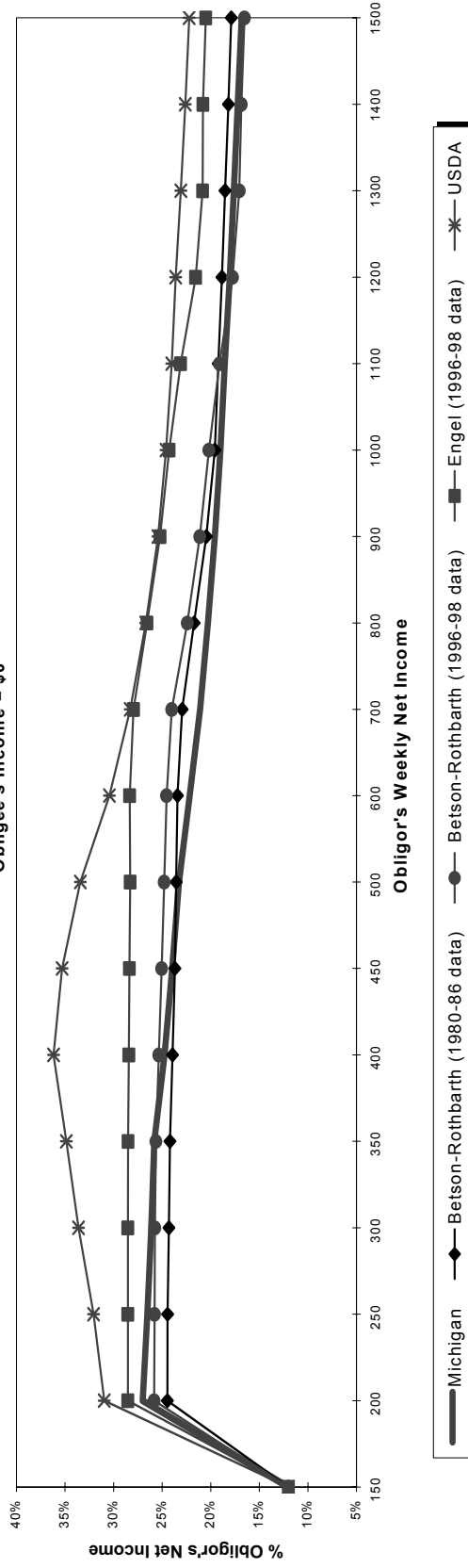
As seen in the previous two-child example (Exhibit II-9), the Michigan Formula tracks very closely to the Betson-Rothbarth obligations, with the Engel obligations slightly higher and the USDA obligations significantly higher, especially at low-incomes.

Exhibit II-12: Two Children, Oblige Income = Obligor Income

Exhibit II-12 considers the scenario where there are two children and the obligee's income is equal to the obligor's income.

Here again, the Michigan Formula is most similar to the Betson-Rothbarth obligations, particularly the old Betson-Rothbarth estimates. Obligations under the new Betson-Rothbarth estimates track below those under the old Betson-Rothbarth estimates at higher incomes. This occurs because the new estimates indicate a smaller amount being spent on children at higher incomes. As in the other exhibits, the Engel and USDA obligations are higher.

Exhibit II-8
Child Support Formulas - One Child
 Obligor's Income = \$0

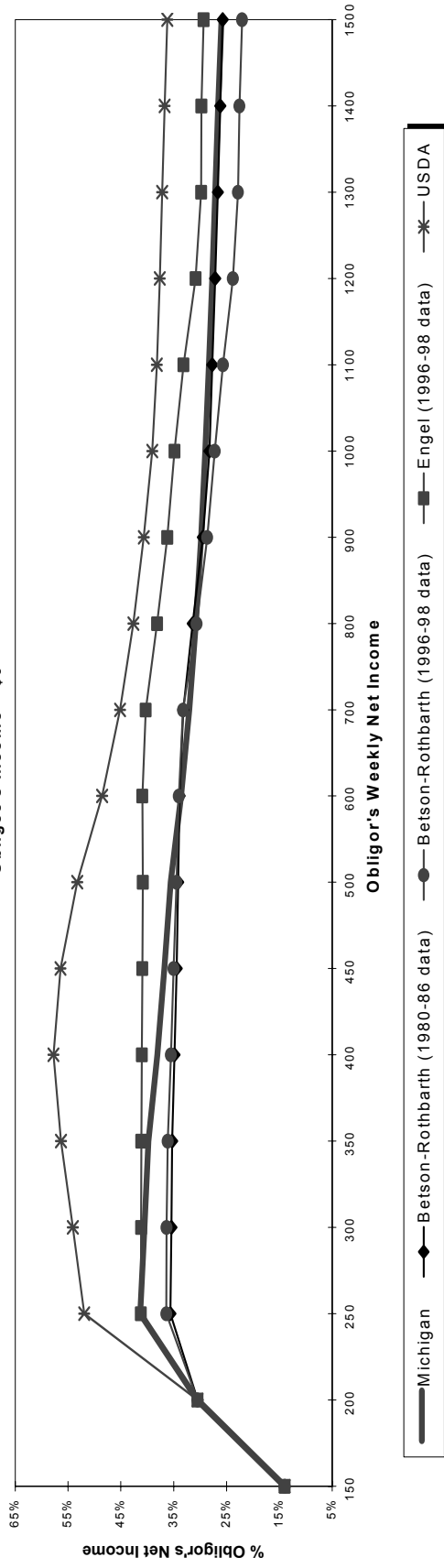


CHILD SUPPORT FORMULAS - ONE CHILD
 Obligor's Income = \$0

Support Due (\$\$ per week)						% of Obligor's Net Income					
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA	Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA
150	18	18	18	18	18	150	12%	12%	12%	12%	12%
200	54	49	52	57	62	200	27%	24%	26%	29%	31%
250	66	61	64	71	80	250	27%	24%	26%	29%	32%
300	78	73	77	86	101	300	26%	24%	26%	29%	34%
350	90	85	90	100	122	350	26%	24%	26%	28%	35%
400	99	96	101	114	145	400	25%	24%	25%	28%	36%
450	108	107	113	128	159	450	24%	24%	25%	28%	35%
500	116	118	124	142	167	500	23%	24%	25%	28%	35%
600	133	140	147	170	183	600	22%	23%	25%	28%	30%
700	148	161	168	196	198	700	21%	23%	24%	28%	28%
800	162	174	179	212	214	800	20%	22%	22%	27%	27%
900	176	184	190	227	229	900	20%	20%	21%	25%	25%
1000	190	196	202	243	246	1000	19%	20%	20%	24%	25%
1100	204	211	210	254	264	1100	19%	19%	19%	23%	24%
1200	217	226	213	259	283	1200	18%	19%	18%	22%	24%
1300	229	241	222	271	300	1300	18%	19%	17%	21%	23%
1400	241	255	236	291	317	1400	17%	18%	17%	21%	23%
1500	252	268	248	308	333	1500	17%	18%	17%	21%	22%



Exhibit II-9
Child Support Formulas - Two Children
Obligee's Income = \$0

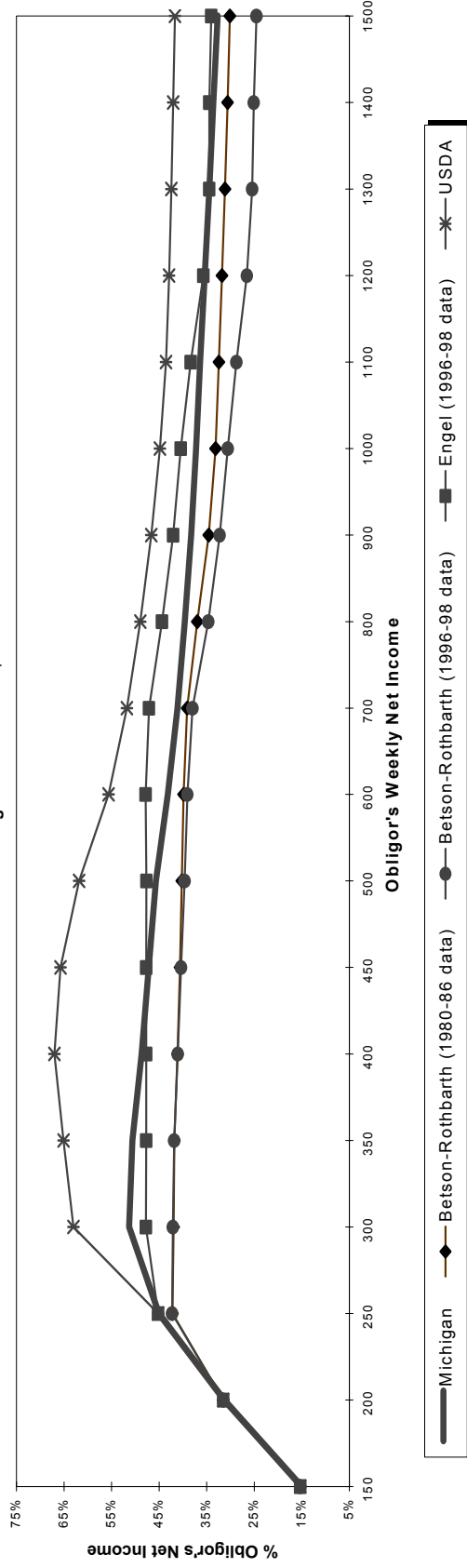


CHILD SUPPORT FORMULAS - TWO CHILDREN

Obligee's Income = \$0

Support Due (\$\$ per week)						% of Obligor's Net Income					
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA	Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA
150	21	21	21	21	21	150	14%	14%	14%	14%	14%
200	61	61	61	61	61	200	31%	31%	31%	31%	31%
250	103	89	91	103	130	250	41%	36%	36%	41%	52%
300	122	106	109	124	162	300	41%	35%	36%	41%	54%
350	139	123	126	144	197	350	40%	35%	36%	41%	56%
400	152	139	142	164	231	400	38%	35%	36%	41%	58%
450	166	155	158	184	254	450	37%	34%	35%	41%	56%
500	178	171	172	204	266	450	36%	34%	34%	41%	53%
600	202	203	204	245	291	600	34%	34%	34%	41%	49%
700	224	232	232	282	316	700	32%	33%	33%	40%	45%
800	247	251	245	305	341	800	31%	31%	31%	38%	43%
900	268	265	258	326	366	900	30%	29%	29%	36%	41%
1000	290	282	272	349	391	1000	29%	28%	27%	35%	39%
1100	312	305	282	364	420	1100	28%	28%	26%	33%	38%
1200	332	326	285	370	451	1200	28%	27%	24%	31%	38%
1300	353	346	297	388	483	1300	27%	27%	23%	30%	37%
1400	372	366	316	417	514	1400	27%	26%	23%	30%	37%
1500	389	386	331	440	543	1500	26%	26%	22%	29%	36%

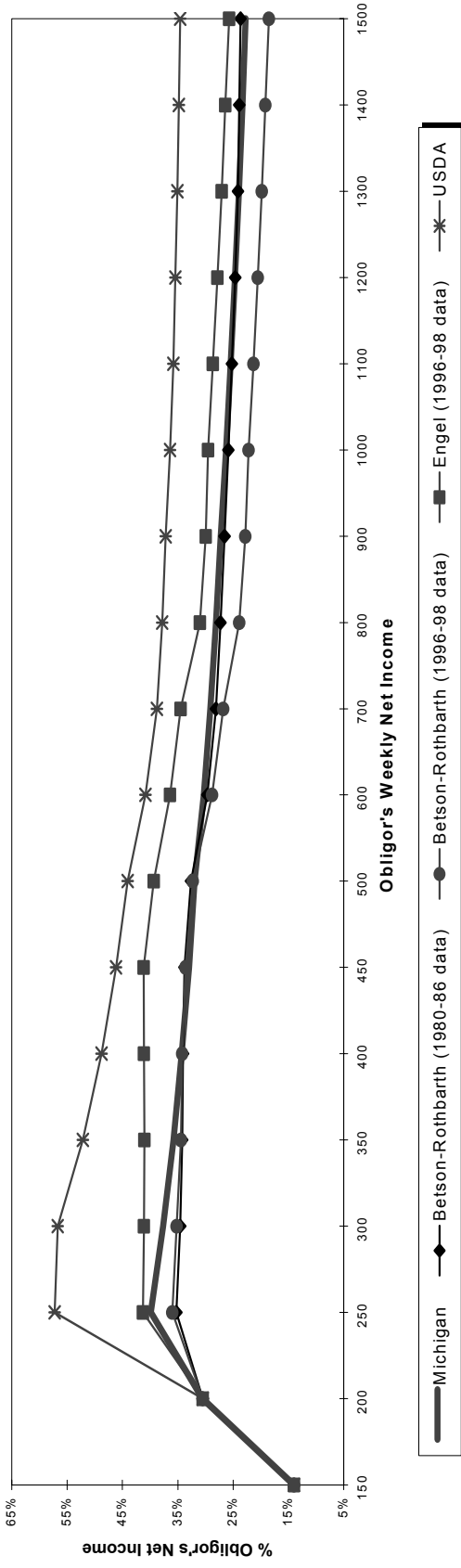
Exhibit II-10
Child Support Formulas - Three Children
 Obligor's Income = \$0



CHILD SUPPORT FORMULAS - THREE CHILDREN
 Obligor's Income = \$0

Support Due (\$\$ per week)													% of Obligor's Net Income				
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)		Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA	Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA					
150	23	23	23	23	23	23	150	15%	15%	15%	15%	15%					
200	63	63	63	63	63	63	200	31%	32%	32%	32%	32%					
250	113	106	106	113	113	113	250	45%	42%	42%	45%	45%					
300	154	126	126	143	143	189	300	51%	42%	42%	48%	63%					
350	177	146	146	167	167	228	350	51%	42%	42%	48%	65%					
400	195	165	164	191	191	268	400	49%	41%	41%	48%	67%					
450	212	183	182	215	215	296	450	47%	41%	40%	48%	66%					
500	229	201	198	238	238	309	500	46%	40%	40%	48%	62%					
600	259	239	234	287	287	334	600	43%	40%	39%	48%	56%					
700	288	274	266	330	330	363	700	41%	39%	38%	47%	52%					
800	317	296	277	355	355	392	800	40%	37%	35%	44%	49%					
900	345	311	290	379	379	420	900	38%	35%	32%	42%	47%					
1000	373	331	306	404	404	449	1000	37%	33%	31%	40%	45%					
1100	401	357	316	422	422	479	1100	36%	32%	29%	38%	44%					
1200	425	381	319	428	428	515	1200	35%	32%	27%	36%	43%					
1300	448	405	331	448	448	552	1300	34%	31%	25%	34%	42%					
1400	471	428	352	482	482	589	1400	34%	31%	25%	34%	42%					
1500	490	452	368	510	510	625	1500	33%	30%	25%	34%	42%					

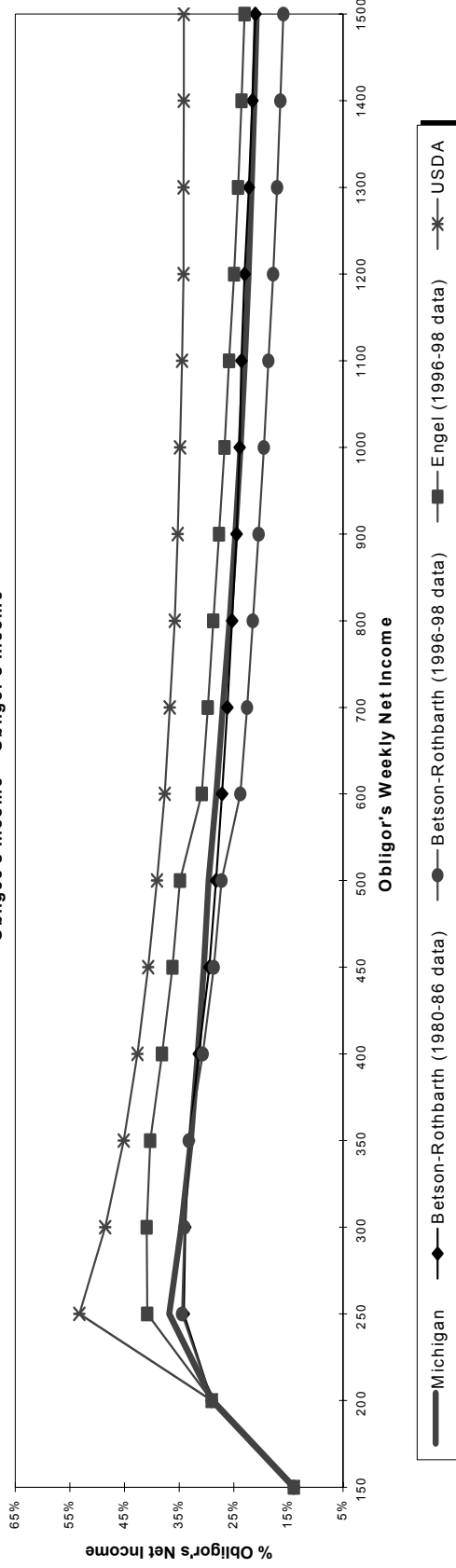
Exhibit II-11
Child Support Formulas - Two Children
 Obligor's Income = 50% of Obligor's Income



CHILD SUPPORT FORMULAS - TWO CHILDREN
 Obligor's Income = 50% of Obligor's Income

Support Due (\$\$ per week)						% of Obligor's Net Income					
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA	Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA
150	21	21	21	21	21	150	14%	14%	14%	14%	14%
200	61	61	61	61	61	200	31%	31%	31%	31%	31%
250	100	88	90	103	143	250	40%	35%	36%	41%	57%
300	113	104	106	123	170	300	38%	35%	35%	41%	57%
350	125	120	120	144	183	350	36%	34%	34%	41%	52%
400	137	136	137	164	195	400	34%	34%	34%	41%	49%
450	148	152	151	185	208	450	33%	34%	34%	41%	46%
500	160	163	161	197	220	500	32%	33%	32%	39%	44%
600	182	178	173	218	245	600	30%	30%	29%	36%	41%
700	204	197	187	241	272	700	29%	28%	27%	34%	39%
800	225	218	191	248	302	800	28%	27%	24%	31%	38%
900	245	239	205	269	335	900	27%	27%	23%	30%	37%
1000	263	259	222	295	364	1000	26%	26%	22%	30%	36%
1100	280	277	234	315	394	1100	25%	25%	21%	29%	36%
1200	296	295	246	334	425	1200	25%	25%	21%	28%	35%
1300	311	314	258	352	456	1300	24%	24%	20%	27%	35%
1400	326	334	269	370	487	1400	23%	24%	19%	26%	35%
1500	341	354	278	386	518	1500	23%	24%	19%	26%	35%

Exhibit II-12
Child Support Formulas - Two Children
 Obligor's Income = Obligor's Income



CHILD SUPPORT FORMULAS - TWO CHILDREN
 Obligor's Income = Obligor's Income

% of Obligor's Net Income											
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA						
150	14%	14%	14%	14%	14%						
200	29%	29%	29%	29%	29%						
250	37%	34%	34%	41%	53%						
300	35%	34%	34%	41%	49%						
350	33%	33%	33%	40%	45%						
400	32%	31%	31%	38%	43%						
450	30%	29%	29%	36%	41%						
500	30%	28%	27%	35%	39%						
600	28%	27%	24%	31%	38%						
700	27%	26%	23%	30%	37%						
800	26%	25%	21%	29%	36%						
900	25%	24%	20%	28%	35%						
1000	24%	24%	19%	27%	35%						
1100	23%	24%	19%	26%	34%						
1200	22%	23%	18%	25%	34%						
1300	22%	22%	17%	24%	34%						
1400	21%	22%	16%	24%	34%						
1500	21%	21%	16%	23%	34%						

Support Due (\$\$ per week)					
Obligor's Net Weekly Income	Michigan	Betson-Rothbarth (1980-86 data)	Betson-Rothbarth (1996-98 data)	Engel (1996-98 data)	USDA
150	21	21	21	21	21
200	58	58	58	58	58
250	92	85	86	102	133
300	104	102	102	123	146
350	115	116	116	141	158
400	126	126	123	153	171
450	137	133	129	163	183
500	148	141	136	174	195
600	169	163	143	185	226
700	189	183	158	208	257
800	206	202	172	230	286
900	222	220	184	249	317
1000	237	239	195	267	348
1100	252	259	205	284	379
1200	267	276	214	299	411
1300	282	289	222	315	445
1400	297	302	230	330	478
1500	312	316	239	345	512



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